

SHARE:

[Join Our Email List](#)

## Outline:

- **ESSM Overview**
- **FY21 Notice of Funding Opportunity**
- **FY20 Awards Selected**
- **Upcoming Annual Community ESSM Meeting**
- **Program Updates: Funded Awards FY19**
- **FY20 (enacted) and FY21 (proposed) Budget Update**
- **Other NOAA and CPO News and Meetings**
- **Staff Changes**
- **Contact Information**

## ESSM Overview

Situated in the [Climate Program Office \(CPO\)](#) in NOAA's Office of Oceanic and Atmospheric Research (OAR), the [Earth System Science and Modeling \(ESSM\)](#) Division supports competitive research to advance scientific understanding of the Earth system and to improve NOAA's Earth system models, predictions/projections and applications to address NOAA's mission in the climate area. ESSM includes four competitive research programs including [AC4](#) (Atmosphere Chemistry, Carbon Cycle), [COM](#) (Climate Observations and Monitoring), [CVP](#) (Climate Variability and Predictability), and [MAPP](#) (Modeling, Analysis, Predictions and Projections). ESSM also supports the NOAA [C&GC](#) (Climate and Global Change) Postdoctoral Fellowship Program.

### Programs

[AC4](#) (Atmospheric Chemistry, Carbon Cycle, and Climate)

[COM](#) (Climate Observation and Modeling)

[CVP](#) (Climate Variability and Predictability)

[MAPP](#) (Modeling, Analysis, Predictions, and Projections)

## FY21 CPO NOTICE OF FUNDING OPPORTUNITY

CPO's annual [call for proposals \(FY21 Notice Of Funding Opportunity - NOFO\)](#) was published on July 21, 2020. ESSM has 5 competitions in FY21. Letters of Intent are due by 5pm ET on August 17, and full applications for all competitions (other than AC4) must be received by 5pm ET on November 30. For the AC4-only competition, the full applications must be received by 5:00 p.m. ET on October 19, 2010. Visit the [CPO Funding Opportunities site](#) for a list of all competitions to view the competition information sheets.

- [Emissions, Air Quality and Heat in urban area \(AC4-only\)](#)
- [COVID-19 Atmospheric Composition Studies \(AC4 and COM\)](#)
- [Ocean Dataset/Product Analysis and Development \(COM, CVP in partnership with GOMO\)](#)
- [Process-Oriented Diagnostics for Climate Model Improvement and Applications \(MAPP\)](#)
- [New Climate Monitoring Approaches and Products for Areas of Climate Risk \(MAPP\)](#)

Several (but not all) competitions reference CPO's climate risk initiative, which is a new focus that targets advancing the areas of Extreme Heat, Water Resources, Coastal Inundation, and Marine Ecosystems. More information can be found [here](#).

## FY20 Funding: ESSM Projects Selected

In FY20, ESSM programs held 7 competitions. Details of selected projects will be announced in early Fall. The following are anticipated to receive funding in FY20:

Supporting the Climate Needs of Fisheries (2 competitions): Approximately 12 *Modeling* projects are anticipated to receive funding from MAPP ([competition link](#)) and 4 *Process Studies* projects are anticipated to receive funding from CVP ([competition link](#)). Funded PIs will contribute to the second Marine Task Force.

Investigating the Urban Atmosphere: Approximately 9 projects are anticipated to receive funding from AC4 ([competition link](#)).

Characterizing and Anticipating Drought: Approximately 11 projects are anticipated to receive funding from MAPP ([competition link](#)). Funded PIs will contribute to MAPP's fourth Drought Task Force.

Explaining Climate Extremes: Approximately 6 (Type 1) projects are anticipated to receive funding from MAPP and CVP starting in FY20 ([competition link](#)).

Developing surface-/ABL datasets through obs-modeling community collaboration: Approximately 7 projects are anticipated to receive funding from COM ([competition link](#)). Projects span ocean, ocean-atmosphere, land-atmosphere, and ice-ocean-atmosphere connections. COM anticipates developing a working group to focus on funded projects and increasing the usefulness of observations to the modeling community.

Constraining Model's Climate Sensitivity: Approximately 7 projects are anticipated to receive funding from MAPP ([competition link](#)). Funded PIs will contribute to MAPP's Climate Sensitivity Task Force.

Decadal Climate Variability and Predictability: Approximately 10 projects are anticipated to receive funding from CVP ( [competition link](#) ). Projects span process-level understanding of the ocean and atmosphere on the interannual to multi-decadal timescales with a focus on mechanisms in either the Atlantic or Pacific region, or the relationship between AMOC and global and regional sea level of the U.S. East Coast.

## UPCOMING ANNUAL ESSM MEETING - will be held jointly with DOE

This year NOAA/CPO/ESSM and DOE/Environmental Systems Sciences Division will jointly organize a community workshop in partnership with USGCRP and USCLIVAR to engage the broader research community to provide input to NOAA's Precipitation Prediction Grand Challenge and DOE's Water Cycle priorities. The workshop will be held in late November 2020 and will be focused on precipitation processes and predictability. Subsequent to the November workshop, it is expected that there will be follow-on workshops in 2021 on more topics, e.g., reducing precipitation biases, improving predictive skill, constraining model uncertainties jointly organized by multiple agencies in USGCRP.

The Science Committee is under selection. Volunteers or nominations are welcome by July 31. [Please fill out this Google form](#) to indicate your interest and nominate members for the Science Committee.

The Workshop will be virtual, open, and take place in late November 2020. If you would like to be added to the workshop attendee list, please also fill out the [Google form](#) .

## Program Update: AC4

### Available reports and white papers:

- [AQUARIUS](#) workshop took place in Salt Lake City, UT, September 25-26, 2019.
- [CO2-USA workshop #3](#) took place in Boston on October 7-8, 2019.
- AC4 is participating in Chemical Sciences Laboratory's [COVID-AQS](#) by complementing measurements in several other U.S. cities

AC4 funded 20 projects as contributions to the FIREX laboratory study and the [FIREX-AQ](#) field campaign. The field campaign with a focus on smoke from wildfires in the U.S. was successfully conducted during the summer of 2019, with several aircraft (ER-2, DC8 and Twin Otters), mobile laboratories and ground sites instrumented to measure a suite of gases and aerosols. The effort has now shifted to the analysis phase. A continuing workshop engaging numerous scientists is now being held on a weekly basis with preliminary results being presented and numerous collaborations established. The data is now available from NOAA Chemical Sciences Laboratory and the NASA DAC.

The FY18 competition examining aspects of the nitrogen cycle funded 10 projects and led to the formation of a PI Group. The group, focusing on biogenic emissions and

chamber studies, has been establishing collaborations and sharing data. Several joint papers have been published with others in preparation. The full list of funded proposals is posted on AC4 website.

The FY19 competition focusing on long term trends in atmospheric composition funded 10 projects spanning tropospheric and stratospheric ozone, CO<sub>2</sub>, methane, aerosols and hydroxyl radical (OH) - the key atmospheric oxidant. Projects take advantage of various NOAA and non-NOAA data sources, including ground based and space-based data. as soon as the projects are awarded. There has already been one significant publication examining the amount of CO<sub>2</sub> produced by fossil fuels. The competition led to the formation of a PI Group focusing on atmospheric composition from space. The full list of funded proposals is posted on AC4 website.

**Urban Atmosphere and FY20 priority :** In FY20, AC4 recommended 9 projects focused on studying urban atmosphere in New York, Boston, Salt Lake City, Fairbanks (part of the ALPACA field campaign), San Francisco, and Los Angeles. Competition priority addresses both carbon and chemistry community needs for more data, modeling and analysis, and provides an opportunity for research to inform urban stakeholder action, as related to air pollution mitigation and carbon management.

## Program Update: COM

**New Awards :** No competition was held and no new awards were made in FY19. FY20 Surface/Atmosphere Boundary Layer Dataset Development proposals underwent a two-stage panel review, were selected, and 7 awards will be publicly announced in the Fall.

**Interagency Involvement :** The COM program is engaged in US Global Change Research Program Working Groups (below), and the U.S. CLIVAR interagency group.

- U.S. GEWEX Office Formerly CEWEX, this group is considering Workshop Proposals in U.S. GEWEX focus areas on a rolling basis.
- Observations Working Group This group works to increase communication across observation-based research funding programs and explore transdisciplinary observation-relevant topics.
- Indicators Working Group Research outcomes from the FY17 competition focus are being considered for incorporation into the USGCRP indicators platform. More broadly, the group is considering how to increase the representation of indicators that convey societal impacts due to climate change in the platform.

### Research Highlights:

- COM participated in [round table discussions on “putting ocean data to use”](#). The program has a strong record in funding projects that [demonstrate the value in ocean data](#) in improving climate understanding and modeling.
- Recent outcomes from COM-funded research highlights the program’s contributions to the Climate Program Office’s four priority risk areas. Over the last year, NOAA and Academic Researchers have released a [Global Drought and Flood Catalogue](#) (Water Resources), a new [Extreme Sea Levels](#) dataset (Coastal Inundation), a [data product to better monitor extreme temperatures](#), and a study on the [spatial extent of future heatwaves](#).

- Advancements in climate risk areas rely on foundational authoritative climate datasets funded by the COM program. For instance the [Global Historical Climatology Network dataset](#) supports research across multiple societal-risk areas and the recently archived [Last Millenium Reanalysis](#) allows long-term datasets to be extended further into the past.

## Program Update: CVP

**New CVP Webinar Series:** CVP Webinars return in the late summer and fall 2020.

Topic: Results from the Years of Maritime Continent field and modeling studies. See below for more information. Webinars, past and present, are recorded and posted on the [CVP Website](#).



**ATOMIC Field Campaign Update:** the Atlantic Tradewind Ocean-Atmosphere Mesoscale Interaction Campaign ( [ATOMIC](#) , US-led research) and the EUREC4A (European-led research) field campaigns successfully completed the intensive observation period during the 6 weeks of Jan 6, 2020 to Feb 13, 2020. The key purpose of ATOMIC is to examine air-sea interactions in the tradewind region east and southeast of Barbados including upper ocean processes, mesoscale ocean eddies, ocean interactions with the atmosphere, as well as lower atmospheric boundary layer processes like convection and clouds, and their influence on the ocean. CVP funded 10 projects including five awards to academic institutions for observations and modeling, and five awards to OAR labs. NOAA contributed the use of the NOAA Ship Ronald H. Brown and the NOAA P-3 aircraft. Collaborations for the campaign include the CVP Program, NOAA's Physical Sciences Lab, OAR Laboratories, GOMO's Surface Drifter Program, OAR's UAS Program, NASA, NSF, and Germany, France, United Kingdom, Barbados and the U.S. [A full list of CVP projects are posted on the website](#) . (NOAA Ship Ronald H. Brown and NOAA P-3 at sea during ATOMIC; Photo: N. Graziano)

**Years of the Maritime Continent (YMC) Field Campaigns update:** Webinars are planned for late summer and fall 2020. [CVP-funded PIs](#) will be contacted soon to present in this series. If you would like to attend the webinars, please contact Gabriela Jeliakov ( [gabriela.jeliakov@noaa.gov](mailto:gabriela.jeliakov@noaa.gov) ). Webinars will be recorded and posted on the [CVP Website](#).

**AGU Session "Towards improvement in process understanding and modeling of the Tropical Pacific"** (Session ID: 104660; Section: Ocean Sciences) This session seeks presentations that underscore the fundamental science that will inform the process studies envisioned in the TPOS First Report, discuss advances in modeling capabilities



and relevant field campaign facilities for TPOS 2020, and highlight the use of TPOS data and prospective products for improved process understanding and model improvement. Abstract submissions are now open for this session. Abstracts will be accepted until July 29, 2020. Additional information is available on the AGU Fall Meeting website. Please be aware that AGU will be virtual this year.

**CVP Sponsored Workshops:** are postponed until Spring 2021.

## Program Update: MAPP

The MAPP **CMIP6 Task Force** is in its first year and is led by Ben Livneh (University of Colorado, Boulder), Kate Marvel (Columbia University/NASA GISS), Angeline Pendergrass (NCAR), and Ryan Rkayczewski (NOAA PIFSC). Since getting underway, the TF has organized itself around three topical areas that focus on CMIP6 portrayals of (i) combined extreme events, (ii) cold-climate processes, and (iii) changing water-resources in the western U.S. The group is considering making targeted inputs to the fifth National Climate Assessment. Others from the ESSM community with an interest in these topics in the CMIP6 context are welcome to consider joining -- email Dan Barrie ( [daniel.barrie@noaa.gov](mailto:daniel.barrie@noaa.gov) ) to express your interest. The TF is organizing a special issue in the journal *Earth's Future* that is actively welcoming submissions pertaining to CMIP6.

Three research highlights:

### [New MAPP Research evaluates method to improve snow depth and snow cover estimations](#)

New research evaluates method to improve snow depth and snow cover estimations: The potential improvements could help water managers better understand and anticipate changes in the snow reservoir.

### [Different forces drive storm-induced sea level spikes on U.S. East, Gulf coasts, says CPO-funded study](#)

Using a new powerful NOAA global climate model, NOAA and partner researchers show that big spikes in daily coastal sea levels will increase in the future from the Gulf Coast to the Atlantic coast as warming progresses, but will be driven by differing forces in these two regions.

### [A shift in ENSO is causing worse prediction skill](#)

Despite major progress in monitoring and understanding the El Nino-Southern Oscillation (ENSO), an alternating climate pattern of abnormally warm and cool ocean temperatures across the tropical Pacific, scientists' ability to predict it has not shown steady improvement over the past few decades. Helping to solve this mystery, a new review article funded by the MAPP Program found that a shift in ENSO properties around 1999/2000 may account for the lower prediction skill.

## FY20 and FY21 Budget Updates

The FY20 Budget was passed December 2019. Climate Competitive Research (CCR) which funds the Earth System Science and Modeling Division Programs received an additional 3M. NOAA has submitted their FY21 budget request to Congress. [NOAA's proposed budget](#) for CCR is summarized below:

NOAA's (President's) FY21 budget proposes to eliminate the Climate Competitive Research Subactivity (\$0M). The House's FY21 budget proposes a \$6M increase for the Climate Competitive Research Subactivity. The Senate has not submitted a proposed budget.

**For more information:**

FY19 Enacted [\\$60 M](#) . FY19 Proposed: President ( [\\$0 M](#) ); House ( [\\$0 M](#) ); Senate ( [\\$60 M](#) )

FY20 Enacted [\\$63 M](#) . FY20 Proposed: President ( [\\$0 M](#) ); House ( [\\$71 M](#) ); Senate ( [\\$60 M](#) )

FY21 Enacted - FY21 Proposed: President ( [\\$0 M](#) ); House ( [\\$69 M](#) ); Senate (-)

## NOAA News and Meetings



**NOAA Updates:**

- Dr. Neil Jacobs was nominated by the President to be the 11th NOAA administrator. He is currently the Assistant Secretary of Commerce for Environmental Observation and Prediction, performing the duties of Under Secretary of Commerce for Oceans and Atmosphere. ([Senate nomination status](#))

**CPO and OAR-wide Updates**

- The Climate and Global Change Postdoctoral program [selected eight new fellows in FY20](#). More information on the program's history and recent review can be found [here](#). More information on details about applying to the program can be found on the [UCAR site](#).
- The fifth National Climate Assessment is underway. [A request for comment on the Draft Prospectus of the NCA5 on the Federal Register](#) is open for comment until August 10th 2020. A number of additional Federal Register Notices are anticipated for release in 2020, which will solicit authors and inputs for the report. ESSM-funded scientists are encouraged to participate, if interested.
- New OAR Lab Research Areas: Congress appropriated \$4M in the FY20 budget for the OAR Laboratories and their partners to conduct research on Earth's Radiation Budget (ERB). The ERB program seeks to investigate natural processes and human activities that might alter the reflectivity of the atmosphere and to explore the potential impacts on the Earth system. The program currently supports a dozen projects at 3 OAR Laboratories ([CSL](#), [GML](#), and [GFDL](#)), 2 NOAA Cooperative Institutes ([CIRES](#), [JISAO/CICOES](#)), and a NOAA Cooperative Program ([CPAESS](#)). Half of the projects focus on observations to characterize baseline

conditions in the stratosphere, allowing an improved understanding of aerosol processes and building a capability to detect future changes in this key region. Initial observations will be made by small balloon-borne instrument packages that can sample up to 30 km in altitude. Instruments will also be developed for future use in aircraft-based stratospheric observations. The remainder of the projects are modeling and analysis studies. Several investigate how stratospheric aerosol injection would change stratospheric composition and Earth's radiation budget. Simulating the increased reflectivity resulting from aerosol injection into low-altitude marine clouds is the focus of the other modeling projects.

#### Past Meetings and Workshops:

- The 2019 ESSM Extreme Heat Workshop was held November 18 - 19 in Silver Spring, MD and was open to the broader Earth System Science Community. The workshop's theme was "Climate Research to Enhance Resilience to Extreme Heat". For more information, visit the [workshop website](#). The 2019 ESSM workshop report is now available.
- [CMIP6 Hackathon](#) was held in NCAR, Boulder CO and LDEO, Palisades NY October 16-18 2019 (co-sponsored by MAPP)

## Staff and Program Changes:



[Gregory Frost](#) joined ESSM as a Program Manager for the Earth's Radiation Budget program. Greg received his PhD from the University of Colorado, Boulder, and has been a Research Chemist at NOAA's Chemical Sciences Laboratory since 1995. His research uses observations and models to understand the impacts of atmospheric emissions and chemistry on air quality, weather, and climate. Greg has been the OAR Liaison for Atmospheric Composition and Chemistry since 2018. He has served on a variety of US and international science teams, including his current leadership roles for the Global Emissions Initiative (GEIA) and the International Global Atmospheric Chemistry (IGAC) project.

MAPP is excited to host a [Hollings Scholar](#) this summer. The Hollings program connects undergraduate students with NOAA offices, programs, and laboratories to work on a 10-week project. [Natalie Baillargeon](#) (Smith College, BA, 2021) will work with the MAPP program on a study of the MAPP





Task Force effort, which is nearing almost 10 years -- some MAPP-funded investigators may hear from Natalie as part of her efforts as she explores what has worked in the Task Forces and what could be improved going forward. Natalie has diverse experience working on the biogeochemical consequences of Arctic warming and ecological impacts of utility-scale solar arrays.



[Wenfei Ni](#) (University of Maryland, PhD, 2019) has also joined the MAPP team as a 2020 Knauss Fellow. Wenfei is working on a project to examine MAPP funding and review processes and program structure, and is developing new models for administering competitive program funding based on literature on program administration and examples from other federal and international funding programs. The project aims to examine and find solutions for potential issues related to efficiency of funding, cost-benefit aspects of proposal writing, performance incentivization for funded investigators, funding distribution, and equity. MAPP PIs may hear from Wenfei soon to participate in interviews or provide feedback via a survey.



Julianna Christopoulos (Cornell University, B.S. Atmospheric Science, 2022) is serving as a student intern under the William M. Lapenta Student Internship Program. She is placed in the Atmospheric Chemistry, Carbon Cycle, and Climate (AC4) Program in CPO with her mentors Monika Kopacz and Kenneth Mooney. Though she is placed in AC4, much of her work will be done under the supervision of Daniel Tong. Her research concerns the impact of recent COVID-19

related emission changes (specifically as they impact surface-level ozone) on soybean crop yields across the continental United States.



Gabriela Jeliaskov (UC Berkeley, BS, 2023) will be working with CVP primarily to plan a webinar series and complete a report in publications. Gabriela is involved in various environmental communities on her college campus and is looking to not only develop her understanding of atmospheric sciences, but also to apply her internship to environmental activism.

## CONTACT INFORMATION

### **ESSM:**

Jin Huang (Division Chief; jin.huang@noaa.gov)

Division email: oar.cpo.essm@noaa.gov

### **AC4:**

Monika Kopacz (Program Manager; monika.kopacz@noaa.gov)\*

Ken Mooney (Program Manager; kenneth.mooney@noaa.gov )

Program Email: oar.cpo.ac4@noaa.gov

### **COM:**

Virginia Selz (Program Manager; virginia.selz@noaa.gov )

### **CVP:**

Sandy Lucas (Program Manager; sandy.lucas@noaa.gov)

### **MAPP:**

Dan Barrie (Program Manager; daniel.barrie@noaa.gov)\*\*

Wenfei Ni (Knauss Fellow; wenfei.ni @noaa.gov)

Courtney Byrd (Program Specialist; courtney.byrd@noaa.gov)

Program email: oar.cpo.mapp@noaa.gov

Annarita Mariotti (on detail to White House Office of Science and Technology Policy)

\*Also Climate and Global Change Postdoctoral Program

\*\*Also Assessments Program

